

WHAT IS CLAIMED IS:

1. A semiconductor production apparatus for etching a semiconductor wafer arranged in a container and having a film on the surface thereof, by use of a plasma generated in said container, comprising:

a detector for detecting the temporal change of the amount of light for at least two wavelengths obtained from the surface of said wafer for a predetermined period of said processing time; and

a determining means for determining the etching condition by comparing a predetermined time with the time length between a time point at which the temporal change amount assumes a maximum value for the light of one of said two wavelengths and a time point at which the amount of light for the other wavelength assumes a minimum value.

2. A semiconductor production apparatus according to Claim 1, wherein said determining means determines the thickness of said etched film in the case where said time length is not longer than said predetermined value.

3. A semiconductor production apparatus according to Claim 1, wherein said determining means stops said etching process upon determination that said time length is not longer than said predetermined value.

4. A semiconductor production apparatus for etching a semiconductor wafer arranged in a container and having a film on the surface thereof, by use of a

plasma generated in said container, comprising:

a detector for detecting the interference of the light from said wafer surface during a predetermined period of said etching process;

a comparator means for comparing a predetermined value with the time length between a time point at which the temporal change of the amount of light having one of at least said two wavelengths output from said detector assumes a maximum value and a time point at which the amount of light having the other wavelength assumes a minimum value; and

a control unit for adjusting said etching process upon receipt of the output of said comparator means.

5. A semiconductor production apparatus according to Claim 4, wherein said control unit stops said etching process upon determination that said time length is not longer than said predetermined value.

6. A semiconductor production apparatus for etching a semiconductor wafer arranged in a container and including a plurality of film layers having a first film formed on the surface of said semiconductor wafer and a second film formed above said first film, by use of a plasma generated in said container, comprising:

a light detector for detecting the temporal change of the amount of light having a plurality of wavelengths obtained from said wafer surface during a predetermined time when said second film is etched; and

a detection means for detecting the thickness of said first film based on a specific waveform obtained from the output of said detector.

7. A semiconductor production apparatus according to Claim 6, wherein upon detection by said detector of a temporal change of the amount of the interference light from said wafer surface for a plurality of wavelengths, said detection means detects a unique change of the output of said light detector.